

REMARKS

This application has been carefully reviewed in light of the Office Action dated September 10, 2007. Claims 3 and 4 have been cancelled without prejudice or disclaimer of the subject matter contained therein and new Claim 5 has been added to the application. Accordingly, Claims 1, 2 and 5 are currently in the application with Claim 1 being the sole independent claim. Reconsideration and further examination are respectfully requested.

Claims 1 to 4 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 6,382,600 (“Mahr”); and Claims 1 to 4 also were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,176,325 (“Vidusek”) in view of Mahr. Applicants have reviewed the applied references and respectfully submit that the claimed invention is patentably distinguishable over these references for at least the following reasons.

Independent Claim 1 is directed to an exhaust gas purification apparatus that includes a reduction catalyst and a reducing agent supplier for supplying a reducing agent to an exhaust gas on an upstream side of the reduction catalyst. The reducing agent supplier includes an injection nozzle having a ring shaped protruding ridge formed on an outer peripheral surface of the tip end portion of the injection nozzle. Claim 1 has been amended to emphasize that the ring shaped protruding ridge is arranged to convexly protrude in an outward direction substantially orthogonal to a central axis of the injection nozzle and is formed in a shape that is tapered towards an outer peripheral surface of an outer end portion of the ring shaped protruding ridge. Claim 1 also has been amended to emphasize that the outer peripheral surface of the of ring shaped protruding ridge has at least one injection hole for ejecting the reducing agent in the outward direction from the central axis of the injection nozzle. The tapering of the ring shaped protruding ridge narrows the flat surface portion in the vicinity of the at least one injection hole

thereby reducing the amount of reducing agent that can remain around and possibly clog the injection hole. Support for the amendments can be found at least in Figures 2, 3A and 3B, originally filed Claim 4, and throughout the specification, including beginning at page 10, line 13.

The foregoing features of Claim 1 are not seen to be disclose or suggested by the applied references. In particular, the applied references are not seen to disclose or suggest at least the features of a ring shaped protruding ridge arranged on an outer peripheral surface of an injection nozzle to convexly protrude in an outward direction substantially orthogonal to a central axis of the injection nozzle and formed in a shape that is tapered towards an outer peripheral surface with at least one injection hole for ejecting a reducing agent in the outward direction.

Mahr concerns a device for introducing a reducing agent into an exhaust pipe segment on an internal combustion engine. As depicting in Figures 1 and 2 of Mahr, a spray head 6 is attached to a reducing agent line 4. The Office Action contended that spray head 6 corresponds with the ring shaped protruding ridge recited in Claim 1. Without conceding this contention, Applicants respectfully submit that the spray head described in Mahr is significantly different from the claimed ring shaped protruding ridge. For example, the spray head described in Mahr does not taper towards an outer peripheral surface with at least one injection hole in the outer peripheral surface for ejecting a reducing agent in an outward direction substantially orthogonal to a central axis. Rather, the spray openings depicted in Mahr are formed in a dome of the spray head 6 and are arranged to discharge a reducing agent in a direction that is not orthogonal to a central axis. See, e.g., Mahr, col. 2, ll. 17-20.

Vidusek concerns an air atomizing spray nozzle assembly 10 that includes a nozzle tip 18. The Office Action has contended that the nozzle tip 18 corresponds with the ring shaped

protruding ridge recited in Claim 1. Without conceding this contention, Applicants respectfully submit that the nozzle tip 18 described in Vidusek is significantly different from the claimed ring shaped protruding ridge. As depicted in Figures 1, 2 and 3 of Vidusek, the nozzle tip 18 includes a number of discharge orifices 55. Similar to Mahr, however, the discharge orifices 55 are not arranged to discharge in an outward direction substantially orthogonal to a central axis. Instead, the discharge orifices 55 are arranged at an angle much less than 90 degrees from a central axis. In addition, the nozzle tip 18 is not formed in a shape that tapers towards an outer peripheral surface having the discharge orifices 55. Rather, the discharge orifices 55 are formed in the corners of the nozzle tip 18 to facilitate the angled liquid ejection.

Accordingly, neither Mahr nor Vidusek are seen to disclose or suggest at least the features of a ring shaped protruding ridge arranged on an outer peripheral surface of an injection nozzle to convexly protrude in an outward direction substantially orthogonal to a central axis of the injection nozzle and formed in a shape that is tapered towards an outer peripheral surface with at least one injection hole for ejecting a reducing agent in the outward direction. Therefore, independent Claim 1 is believed to be patentably distinguishable over the applied references. Reconsideration and withdrawal of the § 102(b) and § 103(a) rejections of Claim 1 are respectfully requested.

Claim 2 depends from Claim 1 and is believed to be allowable over the applied references for at least the same reasons. Because dependent claims are deemed to define an additional aspect of the invention, however, the individual consideration of Claim 2 on its own merits is respectfully requested.

New Claim 5 depends from independent Claim 1 and is believed to be allowable over the applied references for at least the same reasons. Support for Claim 5 is found in Figures 2 and

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3A to 3C and beginning at page 11, line 11 of the specification. Entry of Claim 5 and independent consideration on its own merits are respectfully requested.

In view of the foregoing amendment and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

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Applicants' undersigned attorney may be contacted in our Irvine, California office at the number indicated below. All correspondence should continue to be directed to the address associated with the customer number provide below.

Respectfully submitted,

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